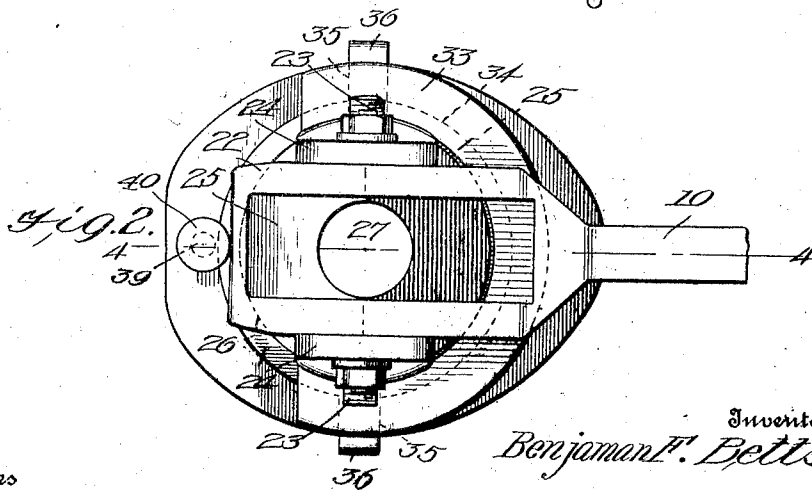
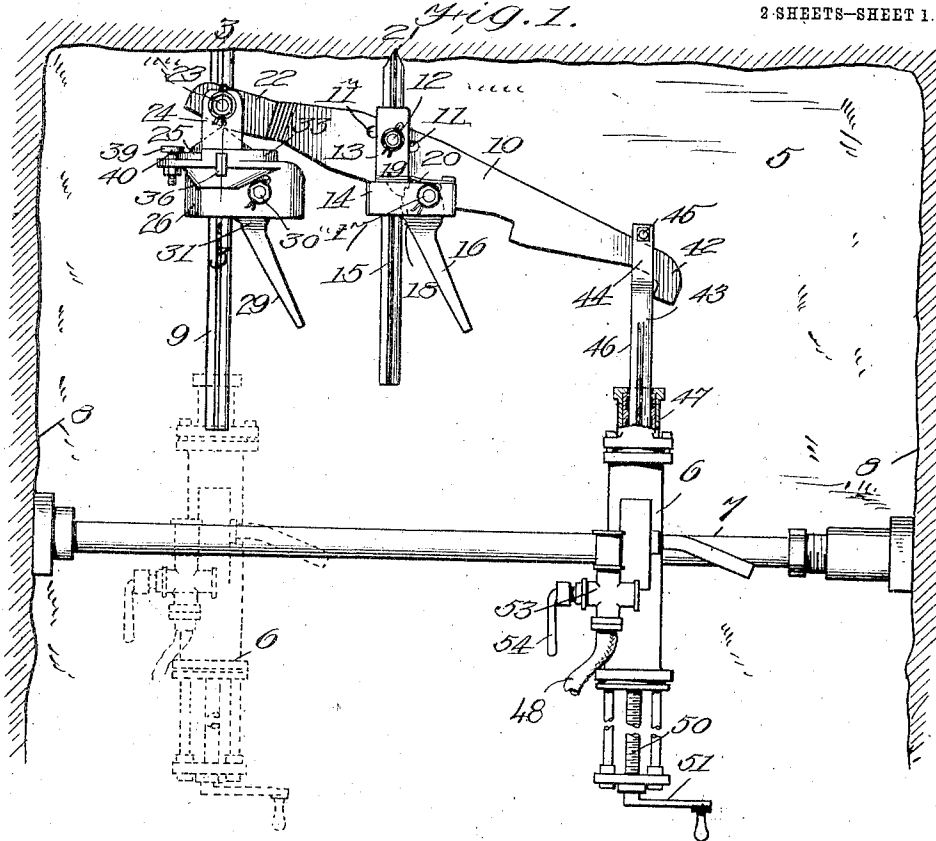


B. F. BETTS.
 DRILL EXTRACTOR.
 APPLICATION FILED MAR. 5, 1912.

1,042,873.

Patented Oct. 29, 1912.

2 SHEETS-SHEET 1.



Witnesses

H. Barry

J. O. Fawcett

Inventor

Benjamin F. Betts

By Victor J. Evans

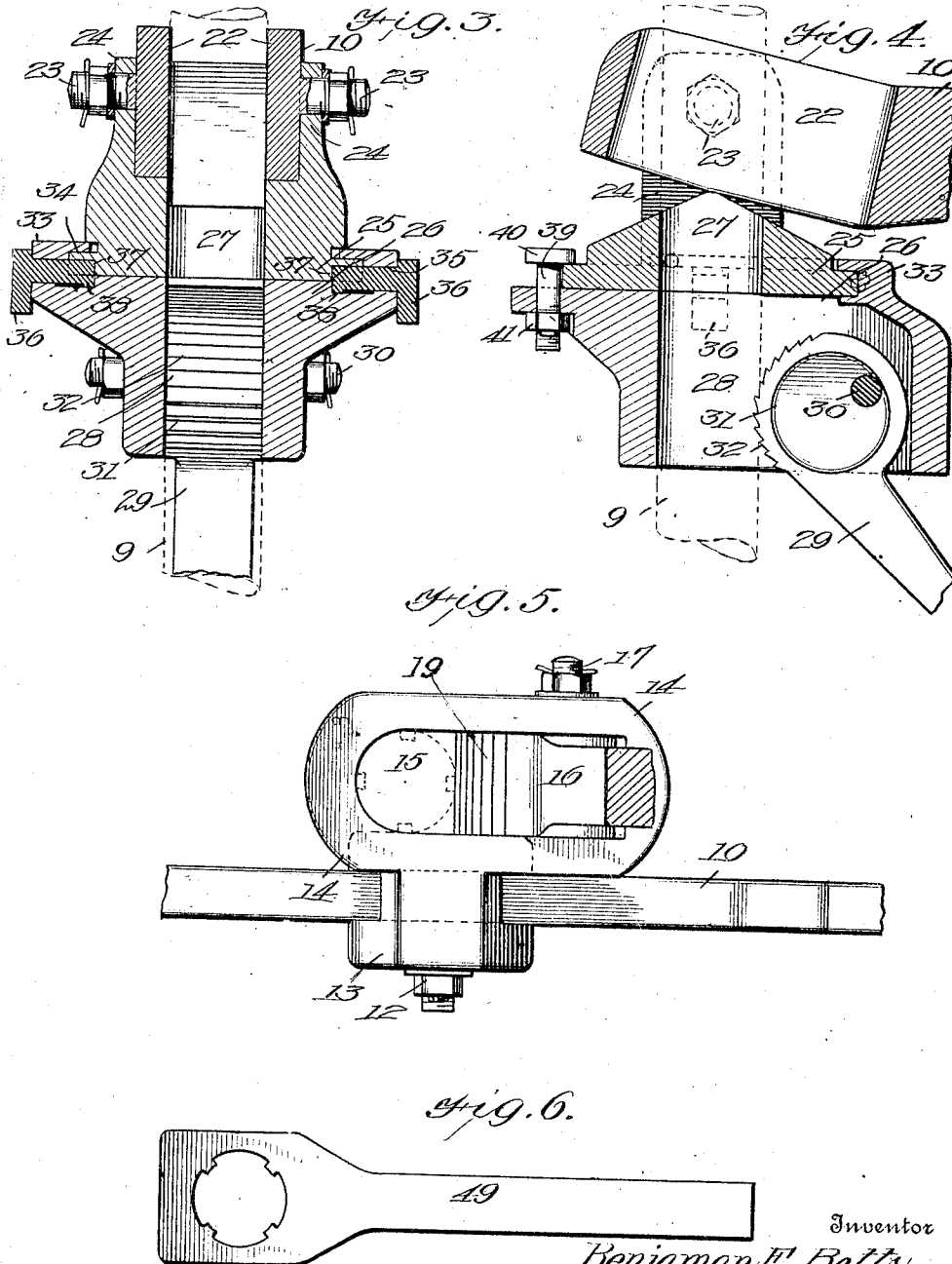
Attorney

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UNITED STATES PATENT OFFICE.

BENJAMIN F. BETTS, OF MAZUMA, NEVADA.

DRILL-EXTRACTOR.

1,042,873.

Specification of Letters Patent. Patented Oct. 29, 1912.

Application filed March 5, 1912. Serial No. 681,753.

To all whom it may concern:

Be it known that I, BENJAMIN F. BETTS, a citizen of the United States, residing at Mazuma, in the county of Humboldt and State of Nevada, have invented new and useful Improvements in Drill-Extractors, of which the following is a specification.

The invention relates to drill extractors, and more particularly to improvements on this type of devices, forming the subject matter of Patent No. 1,024,173, issued to me on April 23, 1912.

The primary object of the invention is the provision of a device of this character in which a drill bit may be readily and easily removed from a hole which the same has bored, after the same has become stuck therein, the device being operated through the power of the drill apparatus for operating the drill.

Another object of the invention is the provision of a drill extractor, in which the drill bit, when stuck in the hole which it has bored, may be readily turned or rotated while engaged in the device, so as to permit the removal of the bit from the said hole, without equiring excessive labor on the part of the operator of the drill.

A further object of the invention is the provision of a drill extractor which is simple in construction, thoroughly reliable and efficient in operation, capable of being readily and easily adjusted, and that is inexpensive in manufacture.

With these and other objects in view, the invention consists in the construction, combination and arrangement of parts, as will be hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the claim hereunto appended.

In the drawings: Figure 1 is a horizontal sectional view, showing a gallery in a mine or quarry, in which a drilling apparatus is positioned and ready for operating the drill extractor constructed in accordance with the invention. Fig. 2 is a fragmentary top plan view of the turning clamp. Fig. 3 is a sectional view on an enlarged scale on the line 3—3 of Fig. 1. Fig. 4 is a sectional view on the line 4—4 of Fig. 2. Fig. 5 is a fragmentary bottom plan view of the extractor. Fig. 6 is a plan view of a wrench for the drill bit to effect the turning thereof when in the extractor.

Similar reference characters indicate cor-

responding parts throughout the several views of the drawings.

Referring to the drawings by numerals, 5 designates the wall of the gallery in a mine or quarry, in which the drilling apparatus 6 is positioned as usual. The drilling apparatus 6, which may be operated by compressed air or steam, is mounted upon a horizontal supporting bar 7 which is secured between the side walls 8 of the gallery, as usual. This drilling apparatus is adapted to operate upon a drilling bit 9 which, in this instance, is supposed to have stuck in a bore which it is forming, the drilling apparatus 6 being indicated in dotted lines as having been supported on the bar 7 in alinement with the bit, as indicated. It should be understood that the drilling apparatus 6 is mounted to slide on the supporting bar 7 in the ordinary well-known manner.

The drill extractor comprises a fulcrum lever or bar 10, which is provided, intermediate its ends, with a plurality of spaced apertures 11 adapted to receive a pivot pin 12 connecting it within a fulcrum block 13, which is in the form of a yoke, through which passes the said fulcrum lever, and is provided at one side with an elongated clamping loop 14, adapted to receive a fulcrum pin 15, the latter being locked therein by means of a cam lever 16 pivoted, at 17, in said loop, the cam portion 18 of the lever 16 being formed with teeth 19 adapted to bite into the pin for locking the same in the loop, the cam 18 of the lever being acted upon by means of a leaf spring 20 which normally sustains the teeth 19 in biting relation to the pin 15, so as to prevent the slipping of the pin when inserted in the clamping loop of the fulcrum block. The pin 15 is reversely beveled at one end to provide a sharpened edge 21, so that the same will firmly bite into the top wall of the gallery 5, as shown in Fig. 1 in the drawings. It is, of course, understood that this pin 15 may be of any desirable shape, and any other similar part may be used in lieu thereof. It is evident that the fulcrum bar or lever 10 may be adjusted vertically relative to the pin 15, as the occasion may require for operating the drill extractor.

Formed on one end of the fulcrum lever or bar 10 is an eye or loop 22, through which passes the drill bit 9 for clamping said bit

to the fulcrum lever or bar. Formed on and projecting outwardly laterally from opposite sides of the loop or eye 22 are pivot lugs 23, with which are loosely engaged the vertical ears 24 of a swinging clamping element, comprising a circular head 25 integral with the ears 24, and a turn-table 26, the head being formed with a central orifice 27 adapted to register with an elongated opening 28 formed in the turn-table 26, and adapted to be passed through the said orifice and opening 27 and 28, respectively, is the drill bit 9 to be clamped in the turn-table 26, the latter having arranged in the opening 28 a cam locking lever 29, the same being pivoted, at 30, to the table 26, and the cam 31 thereof is formed with teeth 32 to bite into the drill bit 9 for the secure fastening thereof in the turn-table 26. The table 26 is formed with a semi-circular shaped cleat 33 forming a guideway 34 for receiving a portion of the peripheral edge of the head 25, thereby rotatably mounting the said table 26 on the head, the cleat 33, at diametrically opposite points, being formed with key receiving openings 35, in which are removably inserted locking keys 36, which latter are also adapted to engage in notches 37 formed in the periphery of the head 25, the keys being provided with raised ribs 38 for wedging the same in the notches 37, and when the keys are inserted in the openings 35 and engaged in the notches 37, the turn table 26 will be locked against rotation on the head.

Passed through a suitable opening in the turn-table 26 is a headed bolt member 39, the head 40 of which is adapted to overhang the outer periphery of the head 25 of the clamping element, so as to prevent the disengagement of the head from the cleat 33 on the turn-table, the bolt being provided with a nut 41 of the ordinary type. The opposite end of the fulcrum lever or bar 10 is formed with a downturned retaining toe 42, and on the lever or bar, near its retaining toe, is loosely engaged a yoke 43, the forks 44 of which are connected by means of a removable cross pin 45 which retains the yoke on the lever or bar, as indicated in Fig. 1 of the drawings. This yoke 43 is formed with a shank 46 which is adapted to be inserted in the chuck 47 of the drilling apparatus, when the drill is removed from alignment with the drill bit 9 and adjusted in position to operate on the fulcrum lever or bar 10, as shown.

With the drilling apparatus mounted on the supporting bar 7, at the toe end 42 of the fulcrum lever 10, the operating fluid is admitted through the hose 48, so as to drive the drilling apparatus and strike against the shank 46 of the yoke 43, thus causing the

toe end 42 of the fulcrum lever to be elevated, whereby a force will be imparted to the drill bit 9 which tends to withdraw the bit. By adjusting the pin 12 in the fulcrum lever 10, the leverage thereof may be varied, as will be apparent. Now, should it be desired to turn the bit 9 without detaching the clamping element engaged therewith, it is only necessary to mount the wrench 49, shown in Fig. 6 of the drawings, upon the outer or free end of the said drill bit 9, and on removing the keys 36 from the openings 35 and the notches 37 in the turn-table 26 and head 25, the said turn-table will be turned simultaneously with the drill bit 9, when the wrench is manually manipulated by an operator.

The drilling apparatus 6 is provided with a feed screw 50, by means of which the body of the drill may be adjusted toward the wall 5 of the gallery or away from it by means of a crank 51, and this facilitates the removal of the drill from the bit before sliding it on the supporting bar 7 to operate upon the fulcrum lever. The drill is provided with a valve or stop-cock 53 operated by a lever 54 for admitting air or steam to operate the drill, as will be readily understood.

With this extractor it will be evident that if the drill bit becomes stuck, the drill cylinder can readily be adjusted and set up in connection with the fulcrum lever 10 and the cooperative parts to enable the power of the drill to be applied to extract the bit. The extractor is particularly useful with power drills, that simply strike the bit and do not reciprocate it.

From the foregoing, taken in connection with the accompanying drawings, it is thought that the construction and operation of the invention will be readily understood, without requiring a more extended explanation.

What is claimed is:

The combination with a power drill having a detachable bit, of a bit extractor comprising a fulcrum bar having a looped end, means stationarily supporting said fulcrum bar but permitting rocking thereof, a head pivotally connected with the looped end of the fulcrum bar, a centrally perforated turning member carried by the head and through which is passed the said bit, and a cam lever pivotally connected within the turning member and engageable with the bit for locking the same therein.

In testimony whereof I affix my signature in presence of two witnesses.

BENJAMIN F. BETTS.

Witnesses:

PAT BOYLAN,
PHIL FARREN.